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Diagnostic value of determining the intima-media complex for assessing the characteristics of remodeling and atherosclerotic lesions in patients with systemic sclerosis

Hamroeva Yulduz Saidovna

Bukhara State Medical Institute, Bukhara

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Abstract. The authors examined the intima-media thickness of the common carotid artery in patients with systemic sclerosis. It has been established that this indicator correlates with the age of patients, risk factors and increasing risk groups on the SCORE scale. The above information, that is, early diagnosis of such parameters as the age of patients, risk groups, intimal media thickness, has great prognostic significance in the early detection of cardiovascular risk in patients with systemic sclerosis.

Keywords: Systemic sclerosis, cardiovascular risk, prevention, doppler.

INTRODUCTION

Studies conducted in recent years have shown that the leading cause of life expectancy in rheumatological diseases are cardiovascular complications associated with atherosclerotic vascular lesions. According to numerous studies, the preclinical form of atherosclerosis in patients with rheumatoid arthritis and systemic sclerosis (SSc) occurs much more often than in the general population [2,13]. These cases are the basis for studying the relationship between cardiovascular and autoimmune pathologies [9,11]. However, the leading place in systemic sclerosis is occupied by vascular pathology. The mechanisms of damage to the cardiovascular system and associated complications are still not well understood [7]. At the same time, analyzes conducted in 2015 showed that this pathology has a high risk of death from vascular damage [8,14]. These data highlight the need to study the clinical features of cardiovascular disease in SSc.

The results of the study show that patients with SSc have a high mortality rate from vascular damage due to the development of atherosclerosis and account for 28% of all deaths in SSc (3rd place among all deaths) [10].

In patients with SSc, Doppler examination of vessels revealed thickening of the intima-media complex (IMC) of the carotid arteries in the subclinical period of atherosclerosis, and the presence of atherosclerotic plaque in the carotid artery in such patients was detected, which is important for early detection of the disease and prognosis [1].

Studies show that carotid artery intima-media thickness is recognized as a "new" risk factor for cardiovascular diseases [4]. An increase in the intima-media thickness of the carotid artery determines the prospect of cardiovascular complications [3,5,6,12].

The purpose of the study: Evaluation of intima-media thickness (IMT) of the carotid arteries as an early predictor of the development of atherosclerosis in patients with systemic scleroderma.

MATERIALS AND METHODS

The study was conducted on 98 patients aged 35 to 60 years who were treated with a diagnosis of SSc in 2018-2019 in the rheumatology department of the Bukhara Regional Multidisciplinary Medical Center. Patients were studied for the presence of risk factors, such as genetic predisposition, physical inactivity, obesity, hypercholesterolemia and smoking. Systemic sclerosis was diagnosed based on the ACR/EULAR criteria (2013). The level of cardiovascular risk factors in patients with systemic sclerosis was determined based on heredity, smoking, gender, age, bad habits, systolic blood pressure, hypercholesterolemia. For the purpose of early detection of cardiovascular risk in patients with SSc, the SCORE scale was used. In these patients, Doppler ultrasound was used to determine the thickness of the intima-media complex (IMC) in the carotid arteries as an early sign of the development of cardiovascular diseases.

RESULTS

The results obtained when determining the thickness of the intima-media complex (IMC) of the common carotid artery in patients with SSc were 0.98±0.15 mm in the right carotid artery and 0.96±0.16 mm in the left carotid artery. Pathological growth of these indicators (>0.9 mm) was observed in almost half of the patients - 47 (52.2%). When analyzing these indicators depending on the age of the patients, the average IMT value in the group of patients 35-44 years old was 0.89±0.13 mm in the right carotid artery, 0.83±0.13 mm in the left carotid artery, in the group of patients 45-50 years old - 1.01±0.13 mm in the right carotid artery, 0.99±0.14 mm in the left carotid artery, in the group of patients 51-55 years old 0.98±0.13 mm in the right carotid artery, 0.98±0.13 mm in the left carotid artery and in the group of patients 56-60 years old 1.08±0.16 mm in the right carotid artery, 1.07±0.16 mm in the left carotid artery. The analysis showed that IMC thickness directly correlated with the age of patients (r = 0.64), an increase in IMC > 0.9 mm was observed in 12 (80%) patients aged 50–60 years. Carotid artery stenosis was also studied in patients. A total of 12 patients had stenosis, of which 4.0 were aged 56-60 years (Table 1).

TABLE.1.

DIAGNOSIS OF ATHEROSCLEROSIS IN PATIENTS WITH SSC

Indicators	**Number of patients**	**35-44 years**	**45-50 years**	**51-55 years**	**56-60 years**

n (%)	90	28(31,1%)	20(22,2%)	27(30%)	15(16,7%)
Average age	48,4±7,10	39,4±2,74	47,8±1,53	52,7±1,35	57,9±1,47
IMC (mm)					
Right carotid artery	0,98±0,15	0,89±0,13	1,01±0,13	0,98±0,13	1,08±0,16
Left carotid artery	0,96±0,16	0,85±0,13	0,99±0,14	0,98±0,13	1,07±0,16
IMT ≤ 0,9 (mm) n (%)	43(47,8%)	20(71,4%)	8 (40,0%)	12 (44,4%)	3 (20,0%)
Right carotid artery	0,84±0,05	0,81±0,04	0,87±0,05	0,87±0,06	0,83±0,06
Left carotid artery	0,82±0,07	0,78±0,06	0,85±0,05	0,87±0,04	0,83±0,06
IMT > 0,9 (mm) n (%)	47(52,2%)	8(28,6%)	12(60,0%)	15(55,6%)	12(80,0%)
Right carotid artery	1,10±0,09	1,07±0,06	1,10±0,08	1,07±0,09	1,14±0,01
Left carotid artery	1,08±0,10	1,13±0,06	1,09±0,08	1,07±0,09	1,13±0,12

Analysis of the association of IMC with risk factors for cardiovascular diseases in patients with SSc showed that in 35.7% of patients with 1 risk factor, IMC was >0.9 mm higher, and in patients with 2 and 3 risk factors, 62.5 % and 87.5%, respectively (Table 2). The above data suggest that there is a correlation between increased risk factors and IMC thickening in patients with SSc.

TABLE. 2.

Occurrence of IMC indicators with factors risk in patients with SSc

Indicators	**Number of patients**	**IMC ≤ 0,9(мм.) (n=43)**	**IMC >0,9(мм.) (n=47)**
No risk factor	22 (24,4%)	14(32,6%)	8(17 %)
1 risk factor	28 (31,1%)	18(64,3%)	10(35,7%)
2 risk factor	24 (26,7%)	9(37,5%)	15(62,5%)
≥3 risk factors	16 (17,8%)	2(12,5%)	14(87,5%)

Evaluation of IMC of the carotid arteries in patients with systemic sclerosis in the high and very high cardiovascular risk groups revealed a pathological increase in this indicator in 23.4% and 19.1% of cases, respectively. In the high-risk group, this figure was 1.12±0.09 mm in the right carotid artery, 1.10±0.09 mm in the left carotid artery, and in patients in the very high-risk group - 1.11±0.12 mm in right carotid artery, 1.11±0.14 mm in the left carotid artery (Table 3).

TABLE. 3.

Evaluation of SCORE and IMT indicators in patients with SSc

Indicators	**General (n=47)**	**IMC ≥1,0(mm)**	
		Right carotid artery (mm)	**Left carotid artery (mm)**
Low < 1%	21(44,7%)	1,09±0,08	1,07±0,08
Average <5%	6(12,8%)	1,08±0,07	1,05±0,08

High <10%	11(23,4%)	1,12±0,09	1,10±0,09
Very high >10%	9(19,1%)	1,11±0,12	1,11±0,14

Thuse, in patients with SSc, a pathological increase in IMC (>0.9) was observed in 52.2% of patients, and it was found that it has a correct correlation with increasing age of the patients. It was found that in 80% of patients with SSc aged 55-60 years, the IMC thickness (>0.9) was 1.14±0.01 mm in the right carotid arteries and 1.13±0.12 mm in the left carotid arteries. There was also a correlation between risk groups and the thickness of the carotid artery IMC, determined by the SCORE scale: the thickness of the right carotid artery in high-risk patients was 1.12±0.09 mm, the thickness of the left carotid artery was 1.10±0.09 mm, the thickness of the right carotid artery in patients at very high risk is 1.11±0.12 mm, the thickness of the left carotid artery is 1.11±0.14 mm. The above research information, that is, early identification of parameters such as patient age, risk groups, intima-media thickness, as well as their relationship, have great prognostic value in the early detection of cardiovascular risk in patients with SSc.

CONCLUSIONS

The determination of IMC has diagnostic value for assessing the characteristics of remodeling and atherosclerotic vascular lesions and practical significance as a predictor of vascular accidents in patients with SSc.

REFERENCES

1. Farag AN, El Serougy EM, Metawee SA, et al. Subclinical atherosclerosis and peripheral vascular disease in systemic patients: Relation to potential risk factors // The Egyptian Reumatologist. -2015, № 37. –P.23-28.
2. Hamroyeva Y. S., Saidova M. M. Prevention of Cardiovascular Risk in Patients with Systemic Sclerodermia //Pioneer: Journal of Advanced Research and Scientific Progress. – 2022. – Т. 1. – №. 3. – P. 10-15.
3. Kon X, Jia X, Wei Y, et al. Association between microalbuminuria and subclinical atherosclerosis evaluated by carotid artery intima-media in elderly patients with normal renal function // BMC Nephrol.-2012, № 13.-P. 37.
4. Lee SG, Park YE, Choi SY, et al. Systemic sclerosis is not associated with increased coronary artery calcium deposition. // Turk J Rheumatol. -2013, №28(4). –P. 242-250.
5. Man A, Zhu Y, Zhang Y, et al. The risk of cardiovascular disease in systemic sclerosis: a population-based cohort study. // Ann Rheum Dis. -2013, №72. - P. 1188-1193.
6. Shiopu E, Au KM, McMahon MA, et al. Prevalence of subclinical atherosclerosis is increased in systemic sclerosis and is associated with serum proteins: a cross-sectional, controlled study of carotid ultrasound // Rheumatology (Ox-ford). – 2014, №53(4). - P. 704-713.
7. Ананьева Л.П. Интерстициальное поражение легких, ассоциированное с системной склеродермией (прогрессирующим системным склерозом) // Научно-практическая ревматология. -2017, №55(1). –С.87-95.].
8. Ананьева Л.П., Десинова О.В., Конева М.Н. и др. Лечение ритуксимабом интерстициального поражения легких при системной склеродермии // Научно-практическая ревматология. -2013, №51(3). –С.275-278.

9. Моисеев А.А. Современные методы диагностики ограниченной склеродермии // Саратовский научно-медицинский журнал. -2016. Т. 12. № 3. -С.481-484.
10. Руженцова У.Ю. Микроциркуляторные нарушения при системной склеродермии-взаимосвязь с жесткостью сосудистой стенки // Научно-практическая ревматология. -2013, №51(3). –С.275-278.
11. Саад Е.О., Ананьева Л.П., Новикова Д.С., Алекперов Р.Т. Традиционные факторы риска сердечно-сосудистых заболеваний при системной склеродермии и их связь со структурными изменениями сердца. //Научно-практическая ревматология. -2016, Т. 54. №6. -С.687-692.
12. Саидова М.М. Диагностическое значение определения комплекса интима- медиа для оценки особенностей ремоделирования и атеросклеротического поражения у пациентов с ревматоидным артритом // Кардиология в Беларуси-2022. №1(14). -С.47-51.
13. Синяченко О.В., Егудина Е.Д., Микукстс В.Я. и др. Ангиопатия при системной склеродермии // Украинский ревматологичный журнал. -2017. №1(67). –С.5-11.
14. Чотчаева Ф.Р., Зыкова А.С., Чотчаева Ф.Р., Зыкова А.С., Новиков П.И. и др. Диагностика и лечения системной склеродермии // Клиническая фармакология и терапия. 2018, Т. 27. №1. -С.66-73.